

ARE WE FACING THE FATE OF CLASSIC MAYA SOCIETY?

SUMMER 1995

ROTUNDA

the magazine of the Royal Ontario Museum

**BLACK FLIES:
THOSE LITTLE
DEMONS**

**PORCELAIN
IMAGES OF
CANADA**

**WHO BROUGHT
CHARIOTS
TO CHINA?**

**HOW ANTIQUE
ARE THOSE
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A scanning electron micrograph of the head of a black fly. To learn more about these insects (they're not as bad as you may think) turn to page 16.

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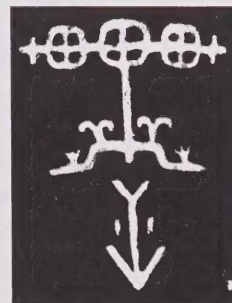
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It's May. Open the cot-tage or pitch your tent, but watch out for those little demons: black flies. Although I have long been an ambulant gourmet feast for these pests, and as such would rather avoid even thinking about them, I found myself intrigued when Doug Currie presented his story. It is cold comfort to learn that very few black fly species bite humans, but their life cycle, especially at the larval stage, is fascinating. In fact, at that point, their appearance is exotic. Black flies are also indicators of the state of the environment in that they can survive only in clean conditions—the cleaner the lakes, rivers, and streams, the more plentiful the black flies. (Talk about good news mixed with bad.) Because of this, I now have more respect for some of my fellow creatures. I will also dress more carefully and use DEET when venturing into nature.

The focus in the next story turns from nature in the raw to its stylized representation. Meredith Chilton explains how she found the inspirational source for the artwork gracing a rare 18th-century Meissen porcelain bowl in the Gardiner Museum. Beginning with her observation that the two scenes on the outside of the bowl were so unlike the popular chinoiserie subjects of the time, including one on the bowl's interior, her research led her to a book about peoples of the world, their dress, and habitat, published in the late 17th century. In it she discovered two illustrations of Canadian subjects that were the obvious models for the Meissen artist. It would appear that for the sake of credibility in European eyes, the unusual dress of the "natives" and the depiction of their environment have been somewhat Europeanized in the book and on the bowl.



In his thought-provoking essay, David Pendergast writes about the "golden age" of Classic Maya society and compares it to our own. According to Pendergast, there is no reason to believe that through study

of the ancient world our society could prevent, with any certainty, history from seemingly repeating itself or that this is even desirable. He asks only that people try to imagine their world under a future archaeologist's trowl so that as change inevitably takes place they might strive to preserve what is truly of value for society as a whole.

And in the last feature story, Barbara Stephen sheds light on the mysterious history of chariots in China. In ancient cultures of Egypt, Mesopotamia, Greece, and regions to the north, chariots were prestigious horse-drawn vehicles that clearly developed from simpler, slower, and more functional carts. They are frequently documented in art and some even survived in well-preserved burials. However, in China the scant evidence of chariots suggests that they were an imported technology with no indigenous precedents. Questions are raised about the identity of the importers and whether the Chinese embraced the specialized chariot but not the more functional cart. The answers may come from some surprising mummified remains.

I hope that you enjoy reading about the fascination of Canada, Chinese chariots, and the state of the world. And may your contacts with black flies be limited to the pages of this issue of *Rotunda*.

Sandra Shaul

SANDRA SHAUL

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*A rare Chelsea porcelain rabbit tureen (c. 1755-1756)
is an extremely valuable recent addition
to the collection of The George R. Gardiner Museum of Ceramic Art*

A Chelsea Rabbit for the Gardiner Museum

In 1755 and 1756, Christie's, the London auction house, published two sales catalogues of porcelains from the Chelsea factory, which included a number of tureens modelled in a naturalistic manner. Among these were several individually described as "A Fine tureen in the form of a rabbit as big as life."

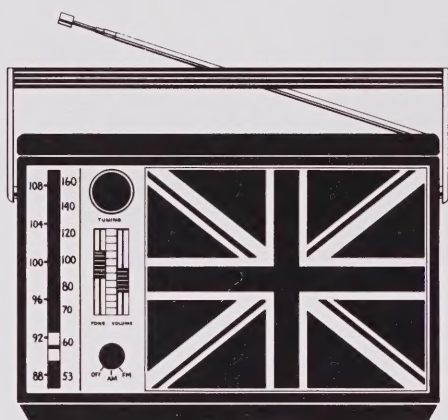
These rare and charming rabbit tureens were used to serve soup or stew at the 18th-century dining table. The fashion for naturalism and naturalistic illusion was at its peak in the

mid 1750s. It is easy to imagine how a table set with dishes shaped in the form of leaves, vegetables, and fruit, as well as a rabbit tureen, or perhaps two, delighted the eye and ravished the senses, while whetting the appetite of diners.

Eight rabbit tureens survive worldwide and each is decorated differently, though they were all made in the same mould. The rabbit crouches low in his patch of cos lettuce leaves, while nibbling some salad. A tiny garden snail crawls upon the leaf he is eating. It is thought that at least 25 of these

fragile masterpieces were made by the factory. Chelsea had a small repertoire of naturalistic zoomorphic tureens, which comprised a hen and chickens, a boar's head, a variety of wild and domesticated birds, several species of fish, and a rabbit. All were created during the red-anchor period of the factory, between 1752 and 1758, when a small red anchor was used to mark wares and figures. These tureens are considered to be among the greatest achievements of Chelsea, which in turn is acknowledged as the finest of England's 18th-centu-

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GROWING COLLECTIONS CONTINUED

ry manufacturers of porcelain.

When an opportunity arose for The George R. Gardiner Museum of Ceramic Art to acquire a Chelsea rabbit tureen from a private collection in Canada, excitement and hopes mounted. The rabbit was one of the jewels in the collection of Elizabeth Stewart who with her husband, James McGregor Stewart, had formed an outstanding assemblage of English porcelain in Halifax after World War II.

Fortunately, the Museum has a friend in Miss Betty Ramsay, Canada's great lady of English porcelain, who is known and much loved by three generations of collectors. She introduced me to Dr. Walter S. Bloom and his sister Carol Bloom Koffler, who wished to honour the memory of their mother, Adele S. Bloom, with a significant gift of English porcelain to a Canadian museum. We later discovered the extraordinary coincidence that Mrs. Bloom had been inspired to collect English porcelain after having visited the exhibition *The Eighteenth Century*, held at the Montreal Museum of Fine Art in 1950, which included this rabbit.

The great generosity of Adele Bloom's children was matched by the Government of Canada, which provided a Cultural Property Grant awarded by the Ministry of Communications (now the Department of Canadian Heritage). The Tecolote Foundation, which for many years has supported the Gardiner Museum's efforts to acquire English porcelain, also made a contribution towards the purchase. The Gardiner Museum is delighted with the addition of the rabbit tureen—the only one of its kind in a Canadian museum—to its collection of Chelsea porcelain. It is the most important single acquisition of English porcelain since the opening of the Museum in 1984.

MEREDITH CHILTON

Meredith Chilton is curator of The George R. Gardiner Museum of Ceramic Art

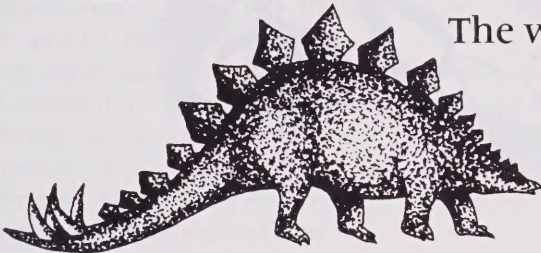
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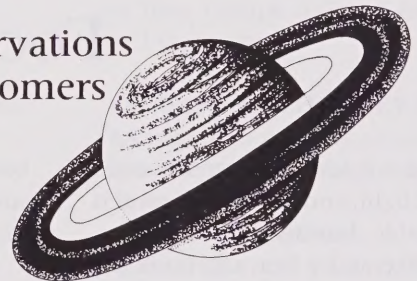


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Food at First Light

THERE IS A MAGIC ABOUT THE DAY'S first light, and the way we greet it at the table. I mean a real breakfast, not coffee and a bun taken on the run, but the sort of breakfast that makes you want to pirouette into the sunlight, seize the day by its lapels, and have your way with it.

Time was when breakfast meant squeezed orange juice, brown toast glowing with freshly spread butter, two eggs fried with a splash of white vermouth, side bacon broiled crisp, a mountain of home fries, and pungent black coffee, pots of it. A Sunday event, as you've guessed. Now such a breakfast would not only begin the day, but *finish* it.

Later on, I would discover fish for breakfast: kippered herring, smoked haddock, and then smoked salmon. I will never, never turn my

back on Atlantic salmon, deeply smoked, finely sliced, and garnished with a handful of capers.

When I began to travel, it dawned on me that the rest of humanity must celebrate the morning even more interestingly, and off I went. Alas, my first encounter was in olde England: eggs nuked to the consistency of drywall afloat in a greasy scum, bumping against battlements of pallid fat—egad, the *bacon*—and ditchwater coffee. The Irish are better at breakfast-making because their raw materials are so remarkable; it takes genius to go wrong.

The French breakfast of coffee and croissants is necessarily simple, in order to leave room for a gastronome's lunch. The Spanish proffer thick slices of toast drizzled with virgin olive oil and salt: *olé*. The

Dutch breakfast of breads, toasts, jams, smoked meats, and the signature gouda cheese spiked with cumin seed, assumes you are starving. Coffee in the Netherlands is probably the best in Europe. It spurs you to charge into the day, and the day after, too.

The best breakfast I have ever eaten in Europe—or, for that matter, anywhere—was not long ago at the Marco Polo Nevskiik, one of the new tourist hotels in St. Petersburg. A sumptuous buffet. I shot past the birdseed laid out for the health-fixated. I heaped a plate high with thick slabs of smoked salmon, unctuous and rich-tasting, and little alps of salmon caviar so fresh it popped on the tongue. Then I returned to the buffet and consumed shameless seconds. The hotel's kitchen team, I

discovered later, had been imported from some faraway place called Toronto.

My perspective altered with Asia. I journeyed to the mystic subcontinent and followed the Indian breakfast from sultry, southerly Madras to the high Himalayas. It ought to begin with a wedge of papaya, fresh, sweet, and not much smaller than the Taj Mahal. Two pillars of this breakfast are *uttapam*, a rice-flour pancake laced with fiery green chilies, and *poori*, a puffed-up pastry pocket filled with a tangy melange of potato and tamarind. Either will leave you ready to wrestle a Bengal tiger.

But the breakfast that I would carry with me into my next incarnation is the South Indian wonder known as *masala dosa*, a crisp, rice flour crêpe stuffed with potato, onion, cumin, coriander, red chilies, and black mustard seed. Traditionally, it comes with *sambar*, a spicy lentil stew, and piquant coconut chutney.

The best *masala dosa* I have ever eaten was at the Taj Palace Hotel in Delhi, where the dosa was almost a metre long and sprawled across the plate like the barrel of a cannon. In addition to the usual accompaniments, it boasted a scintillating red lentil and tamarind chutney. Woe to the gastronomic goof who would spurn such a miracle for eggs.

I ventured to Japan to see how they greet the rising sun. It is always artful but not necessarily accessible. Are you really up for squid intestines or fish-head cartilage with salted entrails?

It took me a few trips to enjoy the Japanese breakfast. My last was at the restaurant Miyaki in the Four Seasons Hotel in Tokyo. Rice porridge topped with kelp and salmon caviar. Stewed tofu with a dollop of fiery *wasabi* was probably as good as tofu will ever get. Baby squids, tiny things, came poached in their own ink. Grilled salmon was delicious. I rolled steamed rice in *nori*, dried seaweed, and it was much, much tastier than it sounds.

The Chinese breakfast recalls an incident of cultural education of

which I am especially fond. One late night in Shanghai, in a stupor induced by fiery *mao-tai*, I volunteered my American tour group for the real thing.

The Americans descended next morning to a surprise banquet of crispy noodles with ham and Chinese greens, dumplings stuffed with ground pork, sweet Chinese sausage, sautéed cucumber, pickled vegetables, unidentifiable tidbits of this and that, and the inevitable *congee* or rice gruel. The Chinese breakfast, I pontificated at the table, beat scrambled eggs silly. I was lucky that morning: my companions were advised that pillorying was strictly prohibited in China.

The following recipes will add some spice to your morning routine.

UTTAPAM

A rice pancake, crisp around the edges, soft in the centre, and laced with cumin seeds, onion, and green chilies.

Ingredients

- 125 ml (1/2 cup) *urad dal* (white-skinned lentils)
- 250 ml (1 cup) *basmati* rice
- 5 ml (1 tsp) salt
- 5 ml (1 tsp) baking soda
- 2 eggs
- 125 ml (1/2 cup) flour
- 250 ml (1 cup) chopped green onion
- 45 ml (3 tbsp) cumin seeds
- 4 hot green chili peppers
- peanut oil for frying

Method

Rinse the *urad dal* in several changes of water, removing any bits of skin or foreign articles. Place the *dal* in a dish, cover with water and soak for 6 to 8 hours or overnight.

After the *urad dal* has soaked, rinse the *basmati* rice well. Place the rice in a saucepan with two cups of water and 5 ml (1 tsp) salt. Bring the rice to boil and then reduce the heat to minimum cooking for about 20 minutes.

Meanwhile place the *dal* in a food processor or blender with 125 ml (1/2 cup) of water. Process until the mixture is extremely fine and frothy. Remove the *dal* mixture to a large bowl and while beating with a wire whisk, add the baking soda,

eggs (one at a time), flour, and finally the cooked rice. Add enough water (about 250 ml or one cup) to make a batter slightly thicker than pancake batter. Beat vigorously for several minutes.

Lightly grease a large griddle or frying pan with peanut oil. Heat the pan to medium high. Pour 125 ml (1/2 cup) of the mixture on to the pan. Place a large spoon in the centre of the batter and with a spiral motion, spread the mixture until the pancake is about 16 cm (7 inches) in diameter.

Sprinkle the top of the pancake generously with cumin seeds, onions, and chilies. Drizzle the outer edge of the pancake with 5 ml (1 tsp) peanut oil. Fry several minutes, until the cake is well browned and beginning to crisp on the edges. Carefully turn the pancake over and brown on the other side.

To serve, invert the pancake on a plate so that the chilies, cumin, and onion are on top. Serve with coriander chutney. Serves six.

CORIANDER CHUTNEY

Stir 45 ml (3 tbsp) coriander chutney base (recipe follows) into 250 ml (1 cup) yogurt.

CORIANDER CHUTNEY BASE

This mixture is extremely versatile and can be used as a seasoning for many other dishes.

Ingredients

- 500 ml (2 cups) packed, cleaned coriander
- 60 ml (1/4 cup) fresh-squeezed lime juice
- 3 large cloves garlic, crushed
- 3 hot green chilies, seeded
- 15 ml (1 tbsp) fresh-grated ginger
- 2.5 ml (1/2 tsp) salt

Method

Place all ingredients in a food processor and mix until ingredients are chopped fine and well blended.

The mixture may be refrigerated for two to three weeks or frozen in plastic containers for future use.

JEREMY FERGUSON

Jeremy Ferguson writes about food and travel

DEATH TAXES

Is modern Western society facing the fate of the Classic Maya?

DAVID M. PENDERGAST

OUR TAX BILLS GO UP EVERY TIME WE TURN around. Administrators' ranks are swollen out of all proportion to the tasks performed, and support for such people eats ever more heavily into the public treasury. Leaders are less and less sensitive to the needs and feelings of their constituents, and seem concerned with managing from day to day instead of planning realistically for the future. City services have dwindled and show every sign of slipping even further in the days ahead. Buildings, many of them unimaginably costly, stand empty all around us, their vacant windows a harsh reminder of dreams unfulfilled. Where once the air was sweet and pleasant, the scent of urban decay wafts ever stronger through the streets. Why has something that went so well for so long gone sour now? Why does no one have solutions to these problems? What is to become of the life we have cherished, and of us?

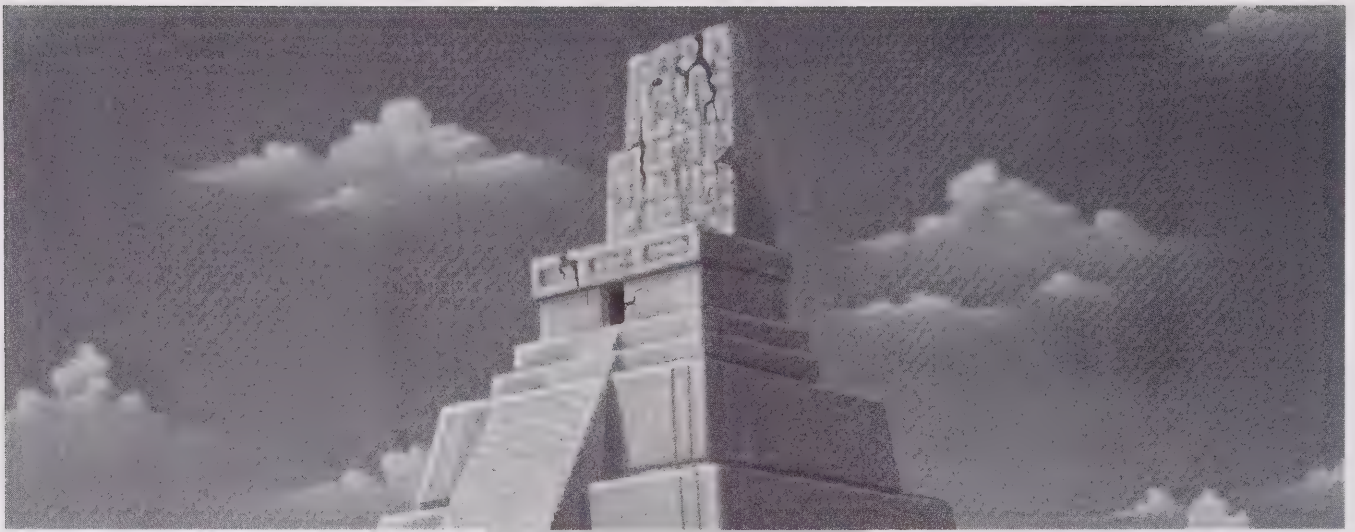
You may think of these complaints and questions as a daily litany of our society, but I hear them both as they are voiced today and as they were voiced in the southern Maya lowlands 1100 years ago. All the concerns and fears that pervade our lives were also present then, and their sharpness was more keenly felt in the Maya cities of AD 895 than it has yet been in ours. We cannot know, of course, exactly how city-dwellers in the distant past expressed their feelings, but it was surely as true of them as it is of us that the disappearance of an ancient and revered way of life was unthinkable, despite evidence of decline on ev-

ery hand. I am certain it was equally true that they could not put their finger on the cause of their problem and had nothing to guide them towards a solution. Is it reasonable, then, to search the Maya past—or any other, for that matter, including their own—for lessons that will guide us along a path away from the pit's edge?

Human beings typically cling to the belief that their own way of life is proof against all forces of nature and humankind. As a result almost everyone finds it nearly impossible to envision a future drastically different from the present, let alone a

*David M. Pendergast is a curator in the New World Archaeology Department,
Royal Ontario Museum*





future that is in no way derived from the present. Can you picture the community you know, so radically altered that you are hard-pressed to find landmarks? Could anyone 25 years ago have foreseen the complete transformation of a rapidly growing city such as Toronto? Now look ahead and imagine your world as it passes through countless shifts and finally comes to be known only as an archaeological site.

Based on my experience, unless you are familiar with the appearance of archaeological sites this task will prove extremely difficult if not impossible. Ask any city resident what archaeologists a millennium from now will learn about life today from the available evidence, and you are likely to receive either a fanciful answer or none at all. Had a similar question been posed to the residents of a 9th-century Maya city, the replies would undoubtedly have been the same. Even though things had gone dreadfully wrong by then, the Maya must have retained the quintessentially human faith in the endurance of the familiar, which makes it impossible to contemplate the severing of all links between present and future. In contrast with catastrophe, slow decay always dangles before one the hope that things are not as bad as they seem and will somehow right themselves before collapse takes place. This means, at least initially, that human beings are incapable of learning from the past because they cannot see ahead clearly enough to perceive the need for the lesson.

When accumulated decay trumpets a message so loud that it cannot be ignored, a society may turn back through its own history in search of the critical spot where the wrong road was taken. If the information is at hand, the search may extend to the records of others' mistakes, where parallel experi-

HUMAN
BEINGS TYPICALLY CLING
TO THE BELIEF THAT
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ALL FORCES OF NATURE
AND HUMANKIND

ence and possible explanations can be sought. In this respect we might seem to be far more effectively forearmed than the Maya, for we have the accumulated knowledge of many centuries and many cultures at our fingertips.

The difficulty is, however, that the seeds of failure leave no clear mark in the chronicle of human achievements. The failures are certainly there, but the decisions that brought them

into being were not seen as such at the time. Who would, after all, take a step that could be recognized as certain to plunge a society into the pit, and then set the matter on record for the guidance of others?

Classic Maya society, a tightly organized system that had roots as far back as 1500 BC, was flourishing in the southern lowlands that are now the Guatemalan Peten and Belize by the 3rd century AD. About 400 years later, near the height of the Classic, the seeds of collapse may have been planted. Often presented as the Maya Golden Age, the middle of the Classic period was a time of tremendous richness in architecture, art, and commerce. The richness was, however, built on the backs of a heavily burdened citizenry.

As the construction of larger and larger temples pressed ever more heavily on a limited work force, both city-dwellers and people in the countryside must have felt themselves drained by the labour taxes as well as by commodity taxes that swallowed up foodstuffs in ever greater quantities to sustain burgeoning construction crews. Those who set increasingly hard-to-obtain stone blocks in place, mixed plaster, and otherwise laboured in temple-building saw around them the opulent dwellings of the community's leaders, and could hardly have failed to note that the numbers of ad-

ministrators, nobles, and priests had increased very sharply over the past century or so. With the increase had come a growing separation between rulers and ruled, and probably a growing distance between senior religious practitioners and the congregations they served.

The rigid control exercised both by the structure of Maya government and by the Maya world view probably prevented public questioning of the way things were going, but it is highly unlikely that such questioning would have occurred anyway. Things were booming; so what if there were more administrators, and they were constantly demanding more of the workers? Life was surely progressing as the gods had ordained, and what they had ordained was not too bad even for the lower echelons of the society. When things were going so well only a fool would have preached caution, and so even if some were prescient enough to wonder how far the bubble could be stretched, they probably remained silent in order not to be thought fools. And for the prescient there was much to see in 7th-century Maya cities: almost everywhere there was the appearance of a social and economic engine running at full steam with the safety valve dogged down tight.

By the 8th century the bubble had weakened, but the possibility that it might burst was probably still unrecognized. Cities were proving difficult to manage as regards the religious requirement of frequent rebuilding, perhaps because the labour force required for the construction work was also needed out on the fields to produce food for support of the urban centres. In addition, stone for building was in perilously short supply in some places. All

thought of raising a 30-metre-high temple several more metres into the air should have been set aside by administrators, but instead they marshalled as many labourers as possible, who took stone from abandoned buildings or settled for smaller and smaller blocks from the quarries, and kept doggedly at the modification of temples (and palaces; leaders could not be expected to govern in shopworn surroundings, after all). By this time at least some leaders must have sensed that the system was not functioning as it should, but like their counterparts in other times and places they probably saw the difficulties as just a short-term downturn in an otherwise upward trajectory.

The period from the early to the mid-9th century provided irrefutable proof that the downturn was long-lasting, if not permanent. In recognition of the problems, leaders began downsizing. Temple modifications grew smaller and were frequently of poorer quality, as the supply of both materials and skilled masons dwindled. Palaces and other civic structures were rebuilt less often, if at all. In some cities the population began to decentralize, perhaps as a result of withdrawal of support for leaders by powerful noble families. By the end of the century, as city services ground to a halt, garbage collection came to be a thing of the past. House-platform

sides and backs, once cleared of refuse by municipal workers who often used construction projects as a kind of sanitary landfill, now became the malodorous resting-places for food remains and all the other detritus of increasingly difficult domestic lives. By this time, no one could have been thought foolish for preaching that the end was nigh.

No better exemplification of the decline of Maya cities exists

CAN YOU
PICTURE THE
COMMUNITY YOU KNOW,
SO RADICALLY ALTERED
THAT YOUR ARE
HARD-PRESSED TO FIND
LANDMARKS?



than one of the main temples excavated by the ROM at Altun Ha in Belize. From its beginnings as a medium-sized but impressively ornamented structure, the temple grew through two large-scale transformations that included elaborate tombs to house rulers' remains. Subsequent changes had two effects: they sealed upper parts of the building off from direct access and public view, and then brought into being a series of smaller and smaller modifications that finally made the top of the structure inaccessible and unusable. Here, it seems to me, is the growing separation between government and the people expressed clearly in architecture.

Several of the smaller modifications recalled the earlier reconstructions by containing rulers' tombs, but the chambers were of far less splendour than those of earlier times. The last of the additions, which has almost the look of an act of desperation, was a tiny, crudely constructed wing just big enough to accommodate a tomb. In the ultimate capitulation to the forces of social disintegration, the builders placed the tomb in a ritually improper spot for a royal burial because this was the only open area left.

In recent years the way in which archaeologists have traditionally viewed this sequence of disastrous Classic-period events has begun to change. Whereas it was once fashionable to speak of the

ologists and the public they have informed have traditionally seen the history of Maya events as a record of failure because Western culture has taught us that expansion is success, slowing of expansion is the beginning of the end, and the end of expansion is failure or death itself. Perhaps it is only now, when expansion is diminishing in Western culture and might be approaching an end of sorts, that it is possible to look back at the Maya with a different perspective.

When we do so, we focus on the fact that even though almost all their great cities fell into ruin, the people themselves survived, as of course they have done to this day despite the onslaughts of European conquest and disease. Who among us can say that more than 3400 years of biological, and in many respects cultural, continuity do not constitute success, no matter what the fate of Classic splendours? Who is to say, too, that the average person, freed from the labour and commodities taxes that were the burden of temple rebuilding, may not have enjoyed a better life in the centuries after the Classic ceased to be?

Much of the Postclassic, perhaps especially in Belize, seems to have been characterized by greater individualism than the earlier centuries of Maya life. In the Maya context the individualism of the Postclassic centuries was almost certainly a good thing



Maya as having failed, and to see the Classic as a pinnacle from which Maya culture slid downward into the ash-heap of decadence, many archaeologists now perceive the Classic collapse simply as a shift in direction.

The change of view is interesting because the interpretation of the past is firmly rooted in our own cultural experience. Archae-

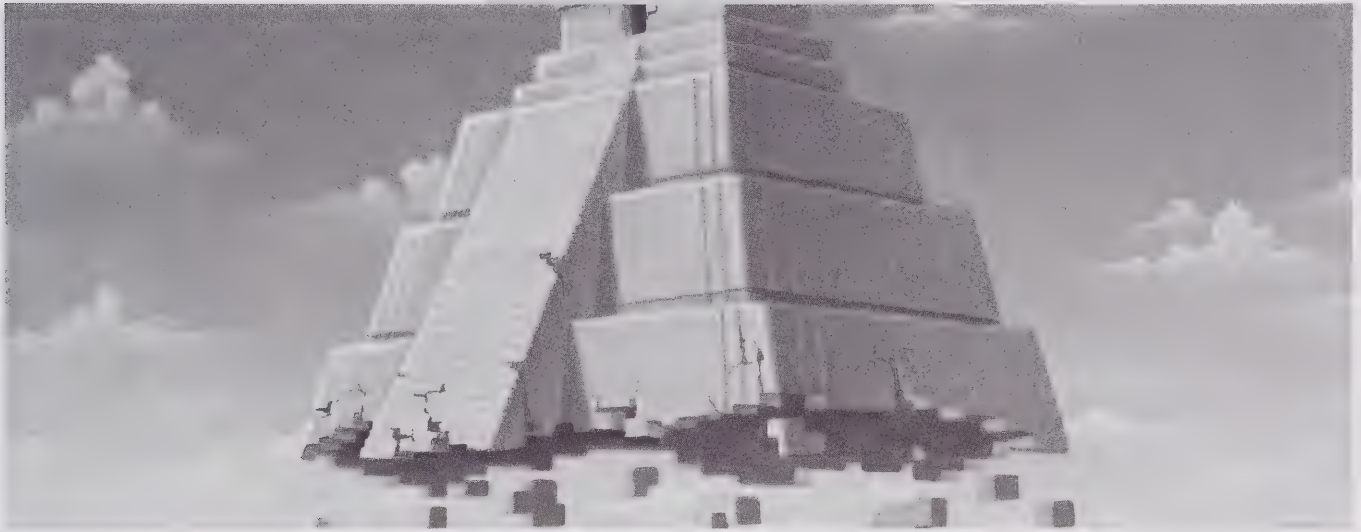
A TINY
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and was part of the strength that got the Maya through times of upheaval and diminished cultural aspirations. In modern North America, in contrast, the term has come to mean the sort of callous, self-centred "me first" point of view. For us, individualism is a symptom—some would say a cause—of the social decay that hollows out the structure

behind the façade of order and prosperity. For the Maya, individualism was in some ways a positive end-product of such decay. This and countless other comparisons show us quite clearly that we cannot simply take the Maya, or indeed any other ancient society, as some sort of model from which we can extract panaceas for the ills that beset our urban lives today.

CONTEMPLATE
A BUSTLING CITY UNDER
AN ARCHAEOLOGIST'S
TROWEL, THEN
DETERMINE TO GUARD
JEALOUSLY WHAT WE
KNOW TO BE GOOD

about the Maya with anything that approaches certainty, we cannot expect to learn much if we ask them about ourselves. Is our centralized government, our transportation system, our management of agricultural production, or our exploitation of natural resources the key to survival, or the seed of collapse? Was last year's or last week's or yesterday's decision by some lev-



From the time of Confucius's dictum "Study the past if you would divine the future" (*Analects*, Book xii, c. 500 BC) onward, writers have identified the past as a key to the future; George Santayana's view, "Those who cannot remember the past are condemned to repeat it," (*The Life of Reason*, 1905-1906) is probably the best known. There unquestionably are many ways in which the past can help us to understand and evaluate the present, and in some general respects it may also aid us in foretelling the future.

It seems to me, however, that the aphorism should be "We cannot learn specific lessons from the past that are a guarantee against repeating its mistakes." The more I work with what remains of Classic Maya grandeur, the more I recognize that if we hope by studying the past to learn where the pitfalls are and how to avoid them, we hope in vain. Exactly where did the Classic Maya go wrong? What executive decision created the appropriate climate for other steps that combined to set Maya life on a fatal collision course with itself? Was there in fact a decision, or a set of them, that brought the civilization to its knees, or were there factors inherent in the Maya system that eventually dictated its collapse?

Because we cannot answer these questions

of government the straw that will eventually break the social camel's back, or will it actually lighten the burden? And, finally, the most important question of all: are we headed down a road that countless others have trodden before us, and will the end be the same for us as it was for them? The only fair answer to this and all of the other questions is "Who knows?"


Is there any lesson, then, to be gleaned from the successes and failures of ancient societies such as the Maya? I think there is only one, which is that no matter how tightly woven and durable the fabric of society may seem to be, a tiny moth-hole can start it unravelling in such a way that knitting it up again may prove impossible. It is therefore sensible, and probably necessary, to stand in the centre of a bustling city and contemplate the place under an archaeologist's trowel in some distant future moment. If such contemplation guides us, it will do so by instilling in us more concern for our fellow flounders in this uncertain sea, and more determination to guard jealously everything we know to be good about our collective lives. None of this can be guaranteed to protect us from the eventual archaeologist's probing, but at least it will make our journey to that point more bearable, and the record of the trip more pleasant for someone to unearth and analyze. ♡



LITTLE DEMONS

*Do black flies have
any redeeming qualities?*

DOUGLAS C. CURRIE



*And the black flies, the little black flies,
Always the black fly no matter where you go.
I'll die with the black fly a pickin' my bones
In North Ontario-io, in North Ontario.*
REFRAIN FROM "THE BLACK FLY SONG"
BY WADE HEMSWORTH, 1949

THERE CAN BE LITTLE DOUBT THAT BLACK flies have a serious image problem. Nowhere is this more evident than on the Canadian Shield where swarms of this blood-sucking pest in the late spring and early summer can severely restrict outdoor activity. The earliest accounts of black flies can be found in the diaries of 17th-century explorers and missionaries in eastern Cana-

da. The words of Brother Gabriel Sagard give vivid testimony to his experience with black flies as he journeyed up the Ottawa valley in 1623 and 1624: "If I had not kept my face wrapped in a loosely woven cloth, I am almost sure that they would have blinded me, so pestiferous and poisonous are the bites of these little demons. They make one look like a leper, hideous to the sight. I confess that this is the worst martyrdom I suffered in this country." Attitudes towards black flies have hardly changed in 370 years. Yet there is more to "these little demons" than meets the eye (or any other exposed flesh, for that matter).

Black flies are members of the insect or-

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der Diptera, or True Flies—a vast assemblage of two-winged insects that contain some of the most notorious pests known to humankind. Collectively, black flies are close relatives of several other groups of biting flies, including mosquitoes, biting midges (no-see-ums), snipe flies, horse flies, and deer flies.

A popular misconception is that black flies occur only in northeastern North America; especially in the northern woods of Ontario and Quebec, where their vernal infestations are legendary. In fact, the family is worldwide in distribution, occurring nearly everywhere there is freeflowing, unpolluted water. Only Antarctica and a few desert islands can truly be considered “no-fly zones.” Although the family is considered small by dipterological standards, most people are surprised to learn that 1600 species are known worldwide, about 10 times the total number known from Canada. Taxonomic research is uneven globally, so the actual number of species is likely to be much greater. Even in North America, which is among the most completely surveyed regions on Earth, nearly a third of the species have yet to be described and do not even carry a formal scientific name.

Adult black flies are easily distinguished from other blood-sucking True Flies by their overall stocky build, hunched back, and short, cigar-shaped antennae. They range in length from 1.2 to 5.5 millimetres and typically are black or dark brown in colour. However, some species are positively gaudy, sporting variously shaped stripes or spots, or exhibiting hues of orange, reddish brown, silver, or gold. The most noxious black flies in Ontario, including members of the dreaded *Simulium venustum* complex, have bright reflective white patches on their legs. This feature has inspired the vernacular name “white-stockinged fly” (or “white socks”) in many parts of their range.

Another popular misconception is that black flies single out humans for their vampiric activities. Yet relatively few of the 1600 known species definitely prefer humans, and no species of black fly is known to feed exclusively upon human blood. Most black flies can be assigned to one of three broad categories of blood-feeding habits based on their host predilection for humans, other mammals, or birds. In Ontario, for example, only five of the 65

A popular misconception is that black flies occur only in northeastern North America. Only Antarctica and a few desert islands are truly “no-fly zones”



In spite of her intimidating appearance in a scanning electron micrograph (page 17), the black fly known as *Helodon susanae* is not capable of piercing skin to draw blood. The scanning electron micrograph of the underside of the head of a black fly larva (facing page) reveals the rake-like fans.

COURTESY OF D. A. CRAIG, DEPT. OF BIOLOGICAL SCIENCES, UNIVERSITY OF ALBERTA



species known from the province can be considered pests to humans, and only two of them as serious pests. The remaining species are more or less evenly divided between those that favour other mammals and those that favour birds, although some may actually take blood from both. Unlike certain species of mosquitoes and biting midges that feed upon the blood of amphibians and reptiles, black flies are restricted to warm-blooded hosts.

As in the case of most other biting flies, it is only the female that draws blood, and contrary to popular belief, black flies don't remove chunks of flesh when feeding. The time required to reach satiation varies among species, but generally it is in the order of three to six minutes for those that feed upon humans. Distensible abdominal walls enable females to more or less double their original body weight when fully engorged. At this point they can barely fly and must seek a resting place for several days to digest their sanguinary meals. Remarkably, the entire blood-sucking process is executed without the victim's knowledge. The surgical efficiency of black flies contrasts markedly with the pricking sensation caused by mosquitoes, the burning sensation of biting midges, or the brutal slashing of horse flies and deer flies.

Black flies pass through four stages of life to complete their development: egg, larva, pupa, and adult. The first three stages all take place in running water, which, depending on the species, can range from tiny headwater trickles to large rivers. The only running-water habitats unsuitable for black flies are those that are severely polluted or which carry high loads of suspended inorganic matter. In this regard black flies can be indicators of water quality.

For example, the buffalo gnat, *Cnephia pecuarum*, used to be a serious problem for humans and livestock in the lower Mississippi basin. So incredibly abundant was this insect during the 1800s that its attacks caused heavy losses of cattle and mules. However, a combination of flood-control measures and other initiatives by people living in the region caused so much pollution that during the 1900s the number of gnats was reduced to the point where they were no longer considered a problem. Contemporary programs to rehabilitate the environment of the Mississippi tribu-

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The scanning electron micrograph of the side view of a larva's head shows a strand of silk extruded from the front of the head.

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Larval black flies are most often found in stretches of shallow, rapidly flowing water. Population densities as high as 1.2 million larvae per square metre have been recorded



The species of black fly known as *Prosimulium mixtum* is illustrated on the facing page.

taries have been extremely successful. Unfortunately, one measure of this success is the return of the buffalo gnat.

Black fly larvae are exotic-looking sausage-shaped creatures with three recognizable body regions: the head, thorax, and abdomen. The well-developed head bears a pair of apical, rake-like appendages called cephalic fans. When positioned in a current of water the fans capture waterborne organic particles as they pass by, providing the larva with its main source of food. Algae, bacteria, and even smaller particles, such as dissolved organic matter, are all grist for the blackfly larva's mill. So efficient are they at feeding that populations living below a lake outflow can remove virtually all available suspended food within a few hundred metres. The fans are alternately folded and thrust into the mouth, where a formidable array of hairs and brushes wipes them clean of food. The frequency with which the fans are opened and closed depends on how quickly they become loaded with food, but generally it varies from several times a second to once every minute or two.

Larval black flies are most often found in areas of laminar flow—stretches of shallow, rapidly flowing water that slips smoothly over the substrate. Examples of laminar flow can be seen at the lip of a weir or at the top of a boulder nestled just beneath the water's surface. Here black flies can accumulate in enormous numbers, contrasting markedly with the sparse numbers in adjacent regions of turbulent flow. Other favoured substrata include trailing twigs or vegetation, which literally bristle with larvae in the food-rich areas downstream of impounded water. Population densities as high as 1.2 million larvae per square metre have been recorded from such habitats.

Life in flowing water can be hazardous, and black fly larvae are occasionally dislodged from the substrate. Because they are especially vulnerable to predation when drifting freely downstream, it is critical that larvae re-establish themselves as quickly as possible. Waterfowl, fish, and invertebrate predators all occasionally add the fat- and protein-packed bodies of larval black flies to their diet. In many instances a larva's downstream trajectory is arrested by a mooring line—a finely spun silken thread that is extruded from the front of the head to a point on the substrate. Dislodged larvae can escape quickly



THE FLIES THAT LOVE US... AND HOW TO LIVE WITH THEM



Relatively few of the 160 species of black flies known from Canada are pests to humans. In Ontario, only two species can be considered severe pests. Members of the *Prosimulium mixtum* complex emerge just when trees begin to bud in May. Adults are uniformly light to dark brown in colour, without conspicuous markings on the legs. In early June *Prosimulium* is replaced by members of the *Simulium venustum* complex—blackish flies with distinctive white bands on their legs. These villains can render cottage country nearly uninhabitable in June and early July.

The disappearance of the *Simulium venustum* complex in early summer heralds the end of black fly season for most Ontarians even though there may be some local species that will attack humans throughout the summer and well into the fall. *Simulium parnassum* follows hard on the heels of *Simulium venustum*, but it is troublesome only in isolated upland areas, such as Algonquin Park and the Gatineau Hills. *Simulium jenningsi* breeds in large rivers and can be annoying to humans in the vicinity of breeding sites in July and August. The only late-season pest is *Simulium decorum*. This species has several generations per year and is a problem for humans in September and October.

People react to black fly bites in different ways. Individuals who are unaccustomed to bites tend to react more severely than those who are regularly attacked; in fact, hosts can gain a degree of immunity after prolonged exposure to bites. Typically a bite causes a small, raised, itchy weal or local irritation. However, toxins injected during an extended severe attack may produce a more general malaise called "black fly fever." This condition is characterized by headache, fever, nausea, and swollen, painful lymph glands.

Astringent preparations such as calamine lotion and zinc oxide ointment relieve itching when applied directly to the wound. Hands and fingernails should be kept clean to minimize the danger of secondary infection from scratching. For more severe anaphylactic reactions (black fly fever) it is crucial to get immediate medical attention. Over-the-counter antihistamines may alleviate the symptoms, but hypersensitive individuals should consult their physician about what medications to carry when medical assistance is not readily available.

Human responses to black flies can range from mere annoyance—caused by the persistent swarming about the head, and entry into the eyes, ears, nose, and mouth—to serious physical manifestations, as described above. In any case, the level of harassment can be reduced in a number of ways. The only foolproof method is simply to avoid the flies altogether, either by staying clear of breeding sites during the height of black fly season, or by venturing out solely during lulls in female activity. Nights are safe because black flies that feed on human blood do not attack after dark, but be warned that their peak

biting activity occurs just before sunset. Fortunately, unlike mosquitoes and biting midges, black flies rarely attack inside a cottage or tent because their main concern is to escape.

If it is inconvenient or impracticable to avoid black flies, they can be rebuffed simply by wearing appropriate clothing. Females are unable to bite through clothes but can crawl furtively beneath porous garments to reach unprotected flesh, especially under the belt line and around the ankles. Pulling socks over pant cuffs, and using zippered pant flies effectively bar the pests from the nether regions. A T-shirt worn under a tucked-in long-sleeved shirt reduces access to the trunk. Even choice of colours can influence attraction. Lighter hues such as yellows and whites are least attractive to females, whereas darker shades such as blues, browns, and black are most attractive. Therefore, one strategy is to wear blue jeans and a light-coloured shirt, which draws flies away from the head. Alternatively, a head net made of fine mesh effectively protects the head and neck.

A number of repellents (or repelling devices) are reputed to be effective against black flies and other blood-sucking insects. By far the most effective is diethyl toluamide or "DEET." Most familiar brands of repellent contain DEET in varying concentrations, the rule-of-thumb being that higher concentrations afford better protection. DEET is effective when applied either to skin or clothing, but care should be taken to keep it out of the eyes, mouth, and nose. If a person is properly dressed, only a small amount of repellent around the wrists and neck will be enough to keep black flies from crawling beneath the clothes. DEET may irritate the skin of some individuals and must *never* be applied to very young children; it can also have deleterious effects on certain synthetic fabrics, plastics, and paints. Protection of skin may last from minutes to hours depending on the concentration of DEET and the velocity of the wind. Hooded open-mesh jackets impregnated with DEET before use give many hours or even days of effective protection.

Citronella oil and lotions intended originally as "skin softeners" are sometimes advanced as pleasant-smelling alternatives to DEET. Although they provide a modicum of protection when first applied, such formulations are so volatile that they are impractical for extended periods of exposure to black flies. Even more suspect are sonic devices that purportedly repel insects by emitting high-pitched noises. Black flies are deaf, and cannot detect or respond to sounds. *Caveat emptor* is the watchword for anyone investing in such contraptions. Some people swear that Vitamin B1 imparts a degree of protection from black flies, but I am not aware of any supporting scientific literature. Anyone contemplating this option should first consult a physician (and bring along some repellent... just to be sure). D.C.C.

"If we walk in the woods, we must feed mosquitoes." Emerson's words might just as easily be applied to black flies



A newly discovered species of black fly found in Oregon (facing page) obviously feeds on blood. Compare the elongated mouth parts with the shorter ones of *Helodon susanae* (page 17).

PHOTOGRAPH BY D. C. CURRIE

if disturbed or attacked, and then crawl back to safety on their underwater bungy cords. Not all black fly larvae produce a fixed mooring line when attached to the substrate; some extrude a sticky silken thread that eventually becomes snagged or entangled on a submerged object, such as a stone or trailing vegetation.

On reaching maturity the last-stage larva seeks out a place to transform itself into an adult. As with other insects that undergo "complete metamorphosis," the transformation from larva to adult is effected by a non-feeding, more or less sedentary stage called the pupa. Here larval tissues are reorganized to produce a radically different organism in terms of structure and way of life. Some black flies seek out protected areas in which to pupate; others simply stop feeding and immediately set about the process where they are. In either case the sequence of events is essentially the same. The silk that played such an important role in larval attachment and locomotion takes on a rather different quality, and is now adapted for the construction of a protective cocoon.

Following a genetically programmed behavioral blueprint, the mature larva spins a cocoon that can range in form from a shapeless mass of silk covering just the abdomen to a meticulously crafted expansive abode with species-specific shape and adornments. The only constant feature is an opening near the front of the cocoon to allow the emerging adult to escape. Some cocoons are in the shape of a delicate slipper, opening at the level of the substrate; others are described as shoe- or boot-shaped, with the front margin walled in so that the opening is elevated above the substrate. Some cocoons have a collar made from a thickened region of silk to protect the opening, while others have an elegant basket weave. The range of black-fly cocoon design is truly astonishing, with each design characteristic of the species or group of species that produced it. Into the cocoon the exhausted larva nestles, then sheds its final larval skin and begins its short life as a pupa. Only the delicate filamentous gills that serve in respiration project from the cocoon.

Once fully developed, the adult pushes its way through a T-shaped split in the pupal thorax and rises to the surface of the water in a bubble of gas. Males emerge slightly ahead of females and can be im-

mediately recognized by their enormous eyes, which are joined together at the tops of their heads. It almost appears as if they are wearing bifocals because the facets on the upper half of the eye are conspicuously larger than those on the lower half. This bizarre arrangement serves two purposes: the small lower facets are used for routine navigation; the large upper facets are used for finding mates.

In most species of black flies males assemble into airborne swarms over an object called a "swarm marker." The tops of bushes, large stream-side boulders, or large branches of isolated trees are just some of the myriad objects that can serve this function. A female flying into a male swarm is quickly greeted by a host of eager suitors, but only one will successfully mate with her. Once inseminated, the female sets off in search of a blood meal, and the cycle begins once again.

While the negative qualities of some black flies may still make it difficult to appreciate the more fascinating features of this group of insects, consider one more point: the fossil record raises an intriguing question about black flies that relates to current theories about the nature of certain dinosaurs. Black flies appeared in the Jurassic Period (if not earlier), a time when birds and mammals were just beginning to evolve and at least 150 million years before the dawn of human civilization. So what warm-blooded hosts were available for feeding?

Given that dinosaurs were the dominant terrestrial vertebrate during Jurassic times, it seems possible, if not probable, that black flies began their parasitic feasting on these hosts, thereby providing further strength to the current belief that some dinosaur groups—unlike modern reptiles—were warm-blooded. In fact, it can be argued that they are still feeding on these hosts, albeit indirectly, if birds evolved from dinosaurs, as suggested by recent evolutionary studies.

What is clear is that black flies have been with us for a long time. And if we have learned anything from history they probably will continue to flourish long after we are gone. Perhaps it is best to adopt a more philosophical attitude towards these "little demons." An observation from *Prudence* by Ralph Waldo Emerson might just as easily be applied to black flies: "If we walk in the woods, we must feed mosquitoes." ♡



THE CANADA

A small rare porcelain bowl in the Gardiner Museum reveals an 18th-century fascination with Canada

MEREDITH CHILTON

THE QUEST FOR THE PHILOSOPHER'S stone, the elusive and mysterious material said to transform base metals into pure gold, fired the imagination of many alchemists in 17th- and early 18th-century Europe. At the dawn of the scientific age, this research was considered to be entirely plausible, though alchemy was soon to lose its lustre as a serious science.

Princely patrons who supported these early experiments were inspired by an insatiable greed for power and riches. It was not uncommon for a promising alchemist to be considered so valuable a resource that his services were acquired or retained by force. Such was the fate of Johann Friedrich Böttger, a young alchemist who was kept a virtual prisoner by Augustus the Strong, Elector of Saxony and King of Poland. Diverted from his search for the philosopher's stone, Böttger was to discover instead another substance transformed by fire: the white gold we know as porcelain. Augustus the Strong was delighted by Böttger's success and triumphantly founded the first hard-paste porcelain factory in Europe at Meissen in 1710.

Irminger, the Dresden court silversmith, was charged with designing forms for the nascent factory, so it is not surprising that some of the earliest forms made at the factory resemble contemporary silver shapes. Another important source of inspiration was the Far East, where porcelain had been invented by the Chinese almost a thousand years earlier. Chinese and Japanese porcelains, decorated in underglaze blue, or with distinctive colour



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BOWL



The engraving entitled *Canada* (left), a later version of the engraving illustrated on the following pages, is included in a late 17th-century book showing peoples of the world and is the inspiration for one of two exceptional scenes of Canada on a porcelain bowl (below).



PHOTOGRAPH BY BRIAN BOYLE

palettes, were known and prized by wealthy European collectors. Augustus the Strong was to amass one of the largest collections of Oriental porcelain in the West. Pieces from his collection were sent to the Meissen factory to be copied and used as sources of inspiration.

In 1720, a young man, Johann Gregor Höroldt, came to Meissen from Vienna. He eventually became head of the decorating studios at the factory. Under his direction a specific style of chinoiserie decoration evolved, characterized by imaginary Oriental figures painted in whimsical, utopian landscapes, which were contained within decorative frames or cartouches. Höroldt also encouraged his workers to use copperplate engravings as sources. On 9 September 1720, 140 sheets of engravings arrived at Meissen. By 1745, the inventory had increased to 5135.

Just before The George R. Gardiner Museum of Ceramic Art opened in March 1984, an extraordinary Meissen bowl was acquired at auction by George and Helen Gardiner, which they subsequently gave to the institution. The bowl was created in a classic Chinese shape from the early cream-coloured porcelain made at Meissen before 1725. Painted inside is a simple chinoiserie design, typical of the early interpretations of Oriental decoration. The unknown artist's flat, two-dimensional style is quite distinctive. On the sides of the bowl there is more decoration inspired by the Far East: trailing blossoms known at Meissen as *indianische Blumen*, or Indian flowers, which were of course not Indian but Chinese in origin. Workers at the factory at this time were ignorant about geography and called "Indian" everything that was oriental.

What distinguishes this exceptional bowl are the cartouches that were painted on the back and front. They each contain a scene unlike any others I had encountered on Meissen porcelain, and so began a 10-year search to locate their sources.

The scenes were probably executed by an artist other than the one who created the chinoiseries on the sides and interior. In the first, a recumbent man, dressed in furs and armed with a bow and arrows, holds aloft a small furred animal. A palisade is visible behind him. Close by, a young woman, arrayed in a costume that partially reveals her legs and chest, carries a basket overflowing with fruits. A strange





ILLUSTRATION FROM *ORBIS HABITABILIS OPIDIA ET VESTITUS* (LATER VERSION, CANADA, ON PAGE 27)

goat-like creature with two long, straight horns stands by her side. The background shows a distant settlement against a landscape of land and water.

A man and a woman dressed in costumes distinguished by fur hoods and hats are featured in the second scene. They display a catch of fish and trapped animals and birds against a background that includes racks for drying fish as well as a landscape of mountains and water. It occurred to me that these could be scenes of the New World, with the latter showing Inuit in northern Canada.

After many years of sporadic searching in libraries in France and Germany, I found the answer by chance on my own doorstep. Both scenes are in Carel Allard's *Orbis Habitabilis Oppida et Vestitus*, a book with engravings by Aldert Meijer, published about 1695 in Amsterdam. A reproduction of the book is housed in the Fisher Rare Book Library at the University of Toronto. This work, which is based on an earlier book by Johannes de Ram, depicts various cities of the world and the costumes of their inhabitants. National and regional costumes are illustrated by pairs of figures against topographical backgrounds. Allard's popular book was subsequently reprinted in 1709 and 1729 by Pieter van der Aa; and yet another version, based on Johannes de Ram's engravings, was published by Christoph Weigel in Nuremburg in 1703.

Leafing through the Allard facsimile, it was with great excitement that I discovered *Straat Davis en Hudson*, plate 79, which was indeed a scene of northern Canada, like the second scene described from the bowl. Then I found a print called *Nieu Amsterdam at New York*, which looked very similar to the first scene from the bowl. In a later version of the book, this print is renamed *Canada*. Close examination of the town engraved in the background of *Canada* reveals a settlement, which was probably Quebec, located near mountains or a cliff. Since the derivative scene on the Meissen bowl more closely resembles this rendering, the later version of *Orbis Habitabilis* probably served as the ceramic painter's inspiration. With this discovery I suddenly realized that I had uncovered the earliest recorded porcelain decorated with scenes of North America, and that both scenes could be attributed as views of Canada.

Not content to stop the exploration

here, I wondered if the preliminary drawings for the bowl could be located as well. Considering the fragile state of such drawings as well as the number of wars that had repeatedly decimated Saxony since the 1720s, it is surprising that approximately 200 pages of sketches drawn by Höroldt and his artists have survived as the so-called Schultz Codex. The great majority of these small sketches are of the delicate chinoiserie so beloved by Höroldt, and



their final coloured versions are often found on Meissen porcelain of this period. The artist of the Gardiner bowl had made preliminary drawings; they were found preserved on folio 88 of the Codex, together with another sketch drawn from the *Orbis Habitabilis*.

Unfortunately, little is known about costumes of arctic and subarctic Native cultures at the time of the first European contacts. The Davis Strait was explored in the



The second scene of Canada on the bowl (below) was created from a drawing (left), based on an engraving from the same book that inspired the bowl's other Canadian scene (following pages). A chinoiserie scene decorates the bowl's interior (facing page).







1570s and 1580s by John Davis during his quest for a northwest passage. Images of captured Inuit, drawn by Frobisher's party in 1577, reveal hooded fur costumes with back tails. During this period it is known that Inuit women wore trousers made of sealskin or caribou, not dresses as depicted on the bowl. Because one engraving was named *Straat Davis en Hudson*, I searched for material about costumes worn by the Cree of the Hudson Bay region, where trading posts had been established by the English and the French after 1670. According to Swampy Cree information from Attawapiskat, hooded cloaks appeared only after European contact and settlement. Consequently, the costumes drawn in the prints and on the bowl are most likely the products of lively imaginations combined with some accurate details about furs worn by aboriginal peoples in the Arctic.

Obviously puzzled by the appearance of the beaver and the arctic fox that appear in the engravings, the artist at Meissen decided to transform them both into red-coated foxes when he painted the bowl. However, the fish, which may be arctic char, and the drying racks appear to have been rendered quite accurately. The identity of the animal with the long, straight horns remains a mystery.

The figures that appear in the "Canada" scene may be allegorical. Laden with her basket of fruit and surrounded by the abundance of the New World, the female could be interpreted as an image of plenty, more typically shown at this time as the goddess Flora or by the personification of spring. As such she would have symbolized the bountiful resources of the New World. What is certain is that the Meissen artists had no concern about the geographic harmony of their images. Imagery of China and Canada are freely mixed, because both places represented wonder, mystery, and curiosity.

This small bowl, with its unusual decoration that so aroused my curiosity, is a rare treasure. It displays the earliest known painted scenes of Canada's people and landscape to be found on porcelain, and reveals much about the fascination with distant lands and cultures that was so prevalent in 18th-century Europe. This is why it has been named the "Canada" bowl, and you can see it on display at the Gardiner Museum. ♡

CHARIOTS OF CHINA

Who introduced chariots to China?

BARBARA STEPHEN

IN THE ANCIENT WORLD CHARIOTS WERE WIDELY KNOWN AS ROYAL VEHICLES. They were used by Egyptian pharaohs, Mesopotamian kings, and Mycenaean Greek rulers. Because chariots were frequently portrayed in art, and a few actual chariots survived in the dry tombs of Egypt and in waterlogged burials in Armenia, modern scholars have very detailed knowledge of the appearance of these vehicles and the ways in which they were used.

The royal chariots were preceded by other kinds of vehicles. When chariots appeared in the Near East, early in the second millennium BC,



*Barbara Stephen is curator in charge
of the Far Eastern Department, Royal Ontario Museum*



they followed a lengthy tradition of using heavy wagons and carts with solid or plank wheels as service vehicles. The much lighter chariots, with their characteristic spoked wheels, were adopted for hunting, parade, and military functions. Their speed and manoeuvrability were enhanced not only by their design but by the use of horses, instead of slower animals such as oxen, to pull them.

There is disagreement among scholars about where the transition from heavy service vehicle to speedy chariot occurred. Some have argued that the chariot was developed in the Near East, a theory supported by the presence there of earlier vehicles that could have served as prototypes. Most scholars, however, noting the many technological innovations embodied in the chariot, now argue that it more logically derived from earlier wagons and carts used by peoples farther north. Their arguments are strengthened by finds of more and earlier archaeological evidence and also by the fact that the horse had apparently been employed as a domestic animal in the northern regions for several thousand years before chariots appeared. Scientists have found wear, characteristically caused by bits, on the teeth of equine remains. This evidence suggests that horses were ridden by about 4000 BC, long before any proof of their association with vehicles.

While it is easy to find images of Egyptian, Greek, and Near Eastern rulers in their chariots, similar images do not exist for the kings of ancient China. Yet, scientific archaeology, established in China from the first part of this century, has revealed that early Chinese rulers also had chariots, and only a few centuries later than their Western counterparts.

Instead of finding rich wall paintings and airtight tombs, archaeologists in China have had to work from stains in the earth left by decomposed wood and leather from the chariots, and from a few pictographs. After more than 3000 years the stains are but shadowy residues that are difficult to notice and read. Fortunately, the Chinese equipped their vehicles with metal fittings; their presence in burials discovered by archaeologists in the 1930s was the clue to the vehicles' existence.

From a Western perspective, the chariot is associated with peoples who spoke languages of the Indo-European family, and with cultures that extended across northern Eurasia in the second millennium BC. Across its ancient range, this linguistic group used terms related specifically to wheeled vehicles, suggesting that their presence was connected with the migration of speakers from this group.

A common cultural background would help to explain the persistence across space and time of vehicles dependent upon domesticated horses for movement and of various practices connected with their use. Yet until recently, there was scant evidence to demonstrate the presence of such people close to China as early as the arrival of chariots sometime in the 13th century BC.

In desert-dry conditions, archaeologists have found and reported extremely well-preserved mummified corpses of light-haired people of European appearance, dating to as early as 2000 BC. These people formed the dominant population then and for some centuries later in the region of northwestern China now known as Xinjiang province. More recent studies show that features of their culture and clothing have parallels as far west as northern Europe, and it is argued that they were probably members of the broad linguistic and cultural group responsible for the development, use, and spread of chariots.

The north-central area where the first Chinese chariots were found was dominated at the time by Shang culture. This culture had a strong local character, although there were hints of contact with a northern zone in

Preceding pages: A bronze model of a chariot with a team of four horses and a standing driver, 3rd century BC, was found outside Xi'an and west of the tumulus of China's first emperor, Qin Shihuangdi. A pistol crossbow rests against the front of the chariot box.



Above: A bronze food vessel, known as a fangding, dating from the later Shang dynasty, c. 11th century BC, was used to hold offerings to gods and spirits of ancestors. An inscription inside shows a pictograph of a two-wheeled vehicle, probably a chariot. Acquired in 1992 with funds from the Dr. Herman Herzog Levy Bequest.

the form of peculiar types of metal knives, mirrors, and small fittings. While the Chinese were receptive to the introduction of small and useful objects of foreign origin, urban culture in later Shang times (14th to 11th centuries BC), which was based on local Neolithic cultures, was rich in itself. The ruling class enjoyed many luxuries. Ivory, lacquer, and bronze were used for a variety of utensils, and woven silk was present. Finely carved jade ornaments continued an earlier Neolithic tradition of working in stone. Shang society was anything but egalitarian; its kings and ruling class controlled large resources of material and manpower. Kings were buried in huge cruciform tombs, accompanied by large numbers of attendants and slaves. The only unrobbed royal tomb found to date contained hundreds of big bronze vessels, ivories, jades, and other luxuries, including some harness fittings. It was small in comparison to the great tombs, and one can only wonder at the lavish quantity of precious materials that they would have held.

Into this rich and established culture, chariots appeared, even though there is no archaeological evidence of earlier wheeled vehicles. A fully developed chariot was the most advanced vehicle of its time, requiring expert knowledge of its mechanics, including the building of wheels, which in China had 18 or more spokes. Chariot horses had to be specially raised, tended, and highly trained by experienced handlers. Since Palaeolithic times in China, horses were eaten; not until the Shang dynasty is there any sign they were used for work. While it is possible to argue that Western chariots evolved from earlier vehicles of the western steppes, the same cannot be said for China. Scholars agree that the chariots of Shang China must have been based on imported technology.

The discovery of the chariots raises two questions for archaeologists: Why was the first form of wheeled transport to appear in China an advanced vehicle designed for speed or display rather than a simple vehicle for broader service, and where did it come from?

While chariots and carts shared the common characteristics of having two wheels and of being pulled by at least two harnessed horses, there was one significant difference. Carts were normally ridden and driven seated, and were used for carrying people or goods. Chariots were driven and ridden standing, and were used for military campaigns, royal hunts, and ceremonies. Therefore, the box of a cart normally had low sides, while those of a chariot box had to be high enough to support standing dignitaries.

It appears that carts did exist in Shang China and that they arrived at the same time as chariots although, as elsewhere, they were less prestigious than chariots and had less exalted status, even when luxuriously appointed. Understanding of the archaeological evidence published to date has been confused by the routine application of the same Chinese term, normally translated as chariot, to the remains of any two-wheeled vehicle. This follows a much earlier practice. Even in ancient written records the character based on a conventional pictograph of a vehicle with two spoked wheels may have been extended to signify not just chariots and carts, but wheeled vehicles of any type. Its use could have obscured the presence of other models, such as utilitarian four-wheeled wagons. Where we now translate the term as chariot, it might be more accurately read as wheeled vehicle.

Using the accepted distinction between chariots and carts, a review of the findings from a number of cemeteries and lesser burials around the Shang capital at Anyang shows that they contained vehicles with the short-sided, rectangular bodies of carts. These carts had a few metal fittings, and their box sides consisted of posts and rails. While they were often buried complete and with their team of horses, sometimes only some harness fittings were used to represent a vehicle.

However, it was the remains of vehicles with rounded boxes, found nearly 60 years ago in association with the great royal tombs and in a few

Was the first form of wheeled transport in China an advanced vehicle suitable for speed and display?



An ink rubbing of the pictograph cast into the interior of the bronze vessel on the facing page. The upper character shows an overhead view of a two-wheeled vehicle, probably a chariot. The wheels are simply represented with four spokes, whereas the real chariot wheels would have had 18 or more.

The chariots were likely introduced by non-Chinese people similar to those whose mummified remains are today found in northwest China



Top: A Shang pictograph portrays a composite bow and arrow. The reflex curves of the bow indicate that it was constructed of various materials, which represents advanced technology.

Bottom: A Shang pictograph illustrates a horse. Its exaggerated upstanding mane indicates a particular breed of animal. The pony-sized horses that pulled Shang chariots were probably descended from Przewalsky's horse, which roamed wild in Mongolia to modern times.

sacrificial pits in front of a large royal foundation, that indicate the existence of true chariots. Although traces of their superstructure have not survived, I believe enough was found to suggest that the vehicles' boxes were built high enough to support a standing driver. Chinese archaeologists have made no functional distinction between the two models, attributing differences to such factors as development over time.

An abundance of bronze fittings adorned several of these vehicles with rounded bodies; the fittings from one were richly inlaid with turquoise, a highly valued material at the time. It is known from the literature that slightly later conveyances were colourfully decorated. These splendid Shang vehicles, which could have been painted and even lacquered as well, would have made a dramatic impression.

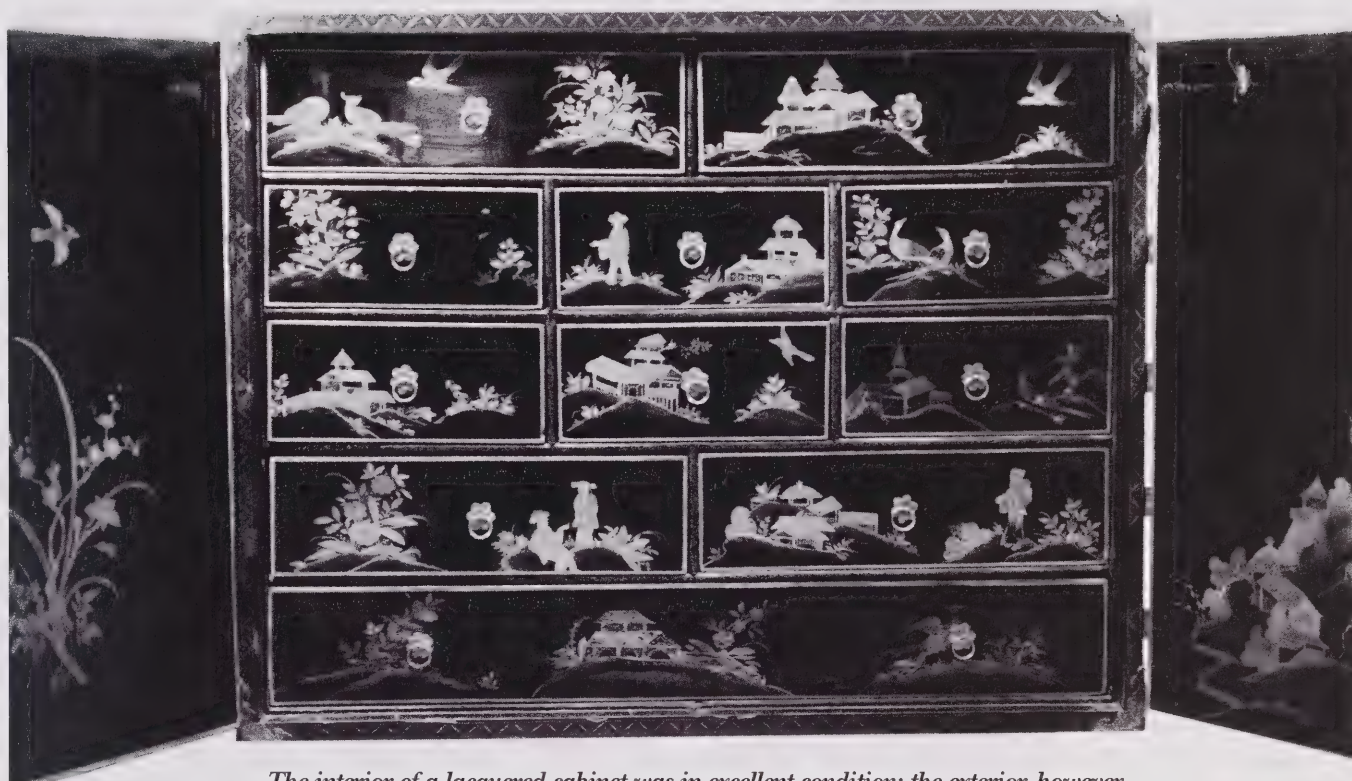
Weapons, including arrowheads, were also found with these vehicles. While the most typical weapon of Shang China was the bronze halberd, the most advanced weapon of the time was the composite bow, the most powerful bow made in antiquity. The construction of composite bows from various materials resulted in a reflex when unstrung and greater tension when strung, giving them additional power. Vehicles equipped with such bows would have been well suited for hunting. Contemporary inscriptions indicate that the Shang kings, like their Western counterparts, used vehicles in royal hunts. Presence of bows is thus a further indication that the vehicles in these burials were true chariots, in which kings would stand to fire at game driven in their direction.

Chariots appear to have been associated with the hunt until Qin times in the 3rd century BC. In a pit not far from the renowned pottery army of Qin, two half-scale bronze vehicles were found. One was a covered cart, its painted decoration indicating luxurious appointments, and the other was a chariot equipped with a parasol and a pistol crossbow for hunting. It was accompanied by a bronze figure of a standing driver, his body leaning against the tall box superstructure.

Not only were the earliest vehicles in China foreign in form, the ways in which they were used also followed foreign practice. If the vehicles had been used differently it could be assumed that they were imported as foreign curiosities. Chinese chariots, like their Western parallels, were employed by rulers and the ruling class for hunting, ceremonies, and military campaigns, and possibly for other upper-class sporting pursuits such as racing. With their team of horses, chariots were considered such great status symbols that they were buried with their high-ranking owners. Shang China's highly stratified society provided the perfect fit with chariots; it offered a class of people who controlled sufficient wealth and human resources to support the expense of owning luxury vehicles. Chariots represented political, military, and economic power.

Returning to the question of how chariots arrived in China, the closest archaeological evidence of related vehicles is from Central Asian regions west of the northwestern province of Xinjiang, and thus in the general area later traversed by the Silk Road. The chariots were very possibly introduced by caucasoid people similar to those whose mummified remains are today found in northwest China. Shang society, with its hierarchy of power, seems to have accepted the chariot as a superior status symbol, and matched it with a range of hunting activities and martial pursuits for which it was ideally suited.

Current and planned archaeological work and research in eastern Russia, Kazakhstan, and northwestern China will certainly illuminate further the history of wheeled transport in these regions. In the next few years it is not only likely that the two questions of how and why the first chariots reached China will be answered in more detail but that more will be discovered of the story behind the preserved faces of the people possibly responsible for introducing them. ❖



The interior of a lacquered cabinet was in excellent condition; the exterior, however, was badly damaged. After careful conservation, the cabinet is now on display.

Retrieving a Japanned Cabinet's Decoration

ONCE AGAIN, THE OPENING OF NEW galleries at the Royal Ontario Museum gave conservators and curators the special opportunity to examine in great detail objects being prepared for display. Several exquisite pieces of japanned furniture, now exhibited in the new Samuel European Galleries, received such careful scrutiny.

Oriental lacquer became increasingly popular in Europe during the 17th century through trade conducted in the Orient by the Dutch East Indies Company and the East India Company. The European demand for lacquerware increased until it could not be met through Oriental sources alone. Early attempts to import raw lacquer to Europe and to cultivate the trees from which it is derived ended in failure, and so new European formulas were developed

using familiar shellac or gum sandarac varnishes as the bases to produce lustrous lacquered surfaces. Layers of varnishes were built up usually on a ground of hide glue and whiting. Lamp black was added to produce the popular black lacquer, and other pigments were used to produce different tints. As the methods for coating and polishing each layer were similar to the techniques used with Oriental lacquer, the final effects were also similar.

A 17th-century English japanned cabinet on an elaborate silver-gilded stand, displayed in the south wing of the galleries, is typical of the period. The cabinet was originally finished using shellac applied with a traditional japanning technique. Gold and other metallic powders were suspended within the layers of shellac. Both the interior and exterior

of the cabinet were coated in this way, with areas of raised decoration applied to the front of the doors.

Common to chinoiserie of the time, the designs include Chinese landscapes, figures, and birds. While they are not exact reproductions of the designs illustrated in *A Treatise on Japanning and Varnishing* written by Stalker and Parker in 1688, some of the landscapes and floral arrangements on the cabinet bear a clear resemblance.

The cabinet's entire decoration was considered to date to the 17th century until it was noted that the exterior surface was crumbling while the interior surface remained smooth and refined. Such a drastic difference could not be explained by the protection afforded to the closed interior. By shining ultra-violet light onto the surfaces, conserva-

tors discovered that the varnishes on the interior reacted differently to the light than those on the exterior. This indicated that the outside of the cabinet had been refinished.

X-rays were taken and further examination was conducted in the ROM's Conservation Department. Chemical analysis was carried out at the Canadian Conservation Institute in Ottawa, in order to determine the history of the cabinet's manufacture, including any modifications. Cross sections of the paint layers show a thick black band that was applied over the original design before redecorating with shellac and oil paint, presumably at some time in the 19th century. Instead of suspended gold powders in the varnish layers, gold leaf was simply adhered to the surface in large patches, with a low-quality oil size used to complete the work.

A second restoration, carried out before the piece came to the Museum in 1960, was also discovered. A synthetic varnish was applied to the badly deteriorated front doors, and the stand, which had been gilded with gold leaf in the 19th century, had been stripped back to its original silver-leaf surface.

X-rays of the doors, taken to determine whether any of the original interior cabinet surface remained, revealed three images: the back and front of the doors as well as a third obscured by the refinishing. Comparisons of the visible decoration with the hidden original decoration

shows that substantial changes were made in the 19th century: buildings replace delicate floral arrangements, several rocks and hills are replaced by figures, and the raised floral decoration is painted out in black.

When the cabinet first arrived in the ROM's Conservation Depart-

of the wood, as well as chipped surfaces. The poor quality oil gilding and bronze powder designs had deteriorated to the point where the design was almost entirely obscured.

The first step in conservation was the simple removal of loose dirt with a soft cotton cloth. Tests on the 20th-

century varnish revealed that it could be removed using solvents without disturbing the underlying 17th- or 19th-century finishes. A small tacking iron was then used to soften the shellac on the interior and press it back into place without the use of an adhesive. As a result there is a sound surface that retains its original character. To view a portion of the 17th-century exterior surface two small windows were made by lifting off the later layers with a scalpel. This uncovered exquisite but incomplete motifs and very brittle material, and so no attempts to uncover the overpainted 17th-century finish were made.

Cracks and some of the losses were filled and then worked to match the surrounding surfaces using traditional japanning techniques. Finally, a coat of dammar varnish was applied to the doors to eliminate their patchy appearance. The next time you visit the south

wing of the Samuel European Galleries, take a closer look at this cabinet and see if you can spot the two different japanning techniques.

MARIANNE WEBB

Marianne Webb is a conservator in the Conservation Department, Royal Ontario Museum



Conservation work on the exterior of the lacquered cabinet has restored it to its former beauty and revealed an interesting history.

ment for an evaluation of its condition, its exterior looked plastic from the modern varnish, and the surface had developed grey blisters where the earlier and later varnishes were separating. The continuous movement of the wood core, brought on by poor relative humidity control, had caused shrinkage and cracking



While both of these masks came from Plains Indian sources, the mask on the right is clearly not of Plains Indian origin.

A Headdress Fit for a Horse?

When a colleague from the Denver Art Museum asked me for some information about the two Plains Indian horse masks in the ethnology collections of the Royal Ontario Museum, I discovered that one of the masks had a very unconventional design. Before any information could be passed on, I had to try to uncover its origins.

One mask is fully decorated with beadwork, with a motif that begins as a bolt of lightning flashing from each eye hole and ends in a stylized eagle claw. These elements relate to the thunderbird and invoke powers that could give strength and speed

to the horse. The mask, which dates to the turn of the century, belonged to Walter Ochapowace, former chief of the Ochapowace Cree Reserve in the Qu'Appelle Valley.

The unconventional mask, according to substantial documentation, was collected on the Blood Reserve of Southern Alberta in the late 19th century; however, it bears no reference to Plains Indian beliefs or manufacturing technique. It is constructed from quilted cloth and sheet brass, bound with Moroccan-style leather thongs.

While I continued to study the mask, the former ROM African gal-

leries came to mind and, in particular, a display case with artifacts from the Battle of Omdurman in Sudanic Africa. Among the artifacts were two examples of quilted head armour.

Given the diversity of the ROM collections and research, the staff of several departments were able to offer their help to correctly identify this perplexing artifact. Anu Liivandi of the Textiles Department found the quilted armour, which closely matched the horse mask in technique. Once a general place of origin had been established, Krzysztof Ciuk, an armour specialist in the

CONTINUED ON PAGE 47

Dear ROM Answers,

I would appreciate information about two chairs that I own. The first is an armchair that came to my mother from her brother. He was a captain in the Canadian army during World War I and married a British army nurse. They owned and operated a high-class inn and guest house, which attracted many permanent residents from Britain. I have reason to believe that this carved armchair was owned by a British guest, who bequeathed it to my uncle. It is 119.5 cm high. The distance across the arms is 75 cm, and the width of the back is 47 cm. It is elaborately carved with shells, scrolls, flowers, and grapes. There are heads that appear to be Chinese at the top of the front scrolled legs. The wood appears to be oak with a very dark stain. It is very comfortable to sit in.

The second is a small side chair 91.5 cm high and 47 cm wide at the front of the seat. Any information that you could provide would be appreciated.

T. G. A., ARNPRIOR, ONTARIO

Dear Reader,

Your armchair could well be English. It follows the style of English chairs with high backs that were first produced about 1680 to 1700. These "Charles II" or "William and Mary" chairs enjoyed a revival during the 19th century when it was commonplace to copy historic styles. Part of the mystique of the style was created by a popular nostalgic view of the cavaliers or wealthy gentlemen of the 17th century, the



tragic execution of Charles I, and the beautiful formal portraits painted by Sir Peter Lely, Sir Anthony Van Dyck, and others. Many original late 17th-century English chairs still survive. In the Victorian period, it was easy for manufacturers to find originals to copy and to improve and embellish the original designs.

A number of features indicate that your chair was made in the 1800s. First, the back is slanted slightly for comfort. The originals from the late 1600s had absolutely vertical backs as they were meant to be formal and to stand flat against the wall when not in use. The front legs follow a cabriole form, that is, they have a heavy knee and a tapering elegant curved lower section. On the originals, the leg would have

followed an S-curve with the top and bottom being more or less equal in volume. (Cabriole legs came into common use only after 1700.)

The originals had cruder and broader carving. Grotesque male heads decorate the legs of your chair. Such heads are found on some baroque designs from the late 1600s; however, I have never seen them on an English chair of this type. It was more usual to have *putti* (small naked infants), which are usually shown as if flying on either side of a crown that is supported between them. This motif was often used for the crest rail (top) of the back and sometimes, on more expensive examples, also for the rail joining the front legs. Collectors consider this carved motif to be a reference to the restoration of Charles II to the throne of England.

The carved scrolls, flowers, and C-scrolls are more exaggerated than those of 17-century chairs. They are closer to the rococo version of these motifs introduced after 1740. The grapes are a later motif and probably inspired by German furniture and cuckoo clocks from the Black Forest, which had great appeal in the mid-1800s. The turned baluster forms, which look a bit like bowling pins with a waist, are an authentic type derived from the late 1600s. However, the Victorian chair-maker did not know how to use them properly. On the lower section of the back legs, they are upside-down.

The upholstery also conforms to later tastes. English 17th-century chairs did not have upholstered arm rests. Backs and seats could be up-

If you possess furniture, silver, glass, metalwork, ceramics, textiles, or small decorative objects that may have an interesting past and have aroused your curiosity, this column is for you. Send a clear black-and-white photograph (or 35-mm colour slide) of the object against a simple background, providing dimensions, a description, any markings, or any known details of its history to: ROM Answers, c/o Rotunda Magazine, Royal Ontario Museum, 100 Queen's Park, Toronto, Ontario, M5S 2C6. Be

sure to enclose a stamped, self-addressed envelope large enough to include any photos that we must return to you with the reply.

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holstered; however panels of woven cane were more common for the back and seat with a well-stuffed loose cushion for the seat. Admittedly, the seat here is probably re-upholstered; however, I suspect that it conforms to its original mid-Victorian, over-stuffed profile.

Finally, oak was seldom used for this model of chair in the late 1600s. Walnut, beech, and ash were popular at the time and were easier to carve. Oak became more commonly used during the 1800s because of changing taste and improved tools and machines for cutting, planing, and carving. The degree of wear on your chair appears to be appropriate for a mid-Victorian decorator piece. Original chairs from the late 1600s frequently show considerable wear and damage, often including many tiny holes where woodworms have eaten them. I agree with your opinion that the chair is likely to be English. Although chairs in a "Jacobean" style were made in Victorian Canada, I have never seen any that are as elaborate as yours.

Your second chair was likely made as part of a commercially manufactured parlour suite consisting of a settee, a gentleman's (arm) chair, two or more side chairs for ladies, possibly a centre table for a lamp, and perhaps a platform rocker. It would date to about 1875-1890 and is likely to be North American. Chairs in this Eastlake style were manufactured both in the United States and Canada. The style is characterized by angular forms, turned legs, and incised linear motifs. It was named for the Englishman Charles Locke Eastlake (1836-1906), who trained as an architect and published *Hints in Household Taste in Furniture, Upholstery and Other Details*. *Hints* was so popular that six editions were published in Boston between 1872 and 1879. The wood appears to be walnut or mahogany. Some furniture in this style was embellished with small panels of walnut or maple with a fancy grain. Your chair appears to

retain its original casters on the front legs which allowed it to be moved more easily. Thank you for writing to ROM Answers. We appreciate your letter.

PETER KAELLGREN,
EUROPEAN DEPARTMENT,
ROYAL ONTARIO MUSEUM

Dear ROM Answers,

We purchased this mahogany chair in the New England area of the United States in 1960. It is a rather



delicate design: 91.5 cm tall and the seat 40.5 cm wide at the front and 25.5 cm at the back. The seat is very beautifully contoured with a depression to fit the sitter. Could you tell us the period and country of origin of this chair?

C. H., VANCOUVER, B.C.

Dear Reader,

During the 1800s, nearly every historical style in Western furniture was copied, revived, and "improved." New machinery was introduced for sawing, planing, and carving wood. This meant that by 1900, much of the popular consumer furniture was manufactured in styles that often had references to earlier periods but also gave evidence of advances in technology. This sometimes makes it difficult for modern viewers to analyze and date turn-of-the-century furniture.

The back of your chair, with its pierced slats, appears to have been

inspired by a combination of traditional ladder-back chairs—English Chippendale-style chairs with pierced crossbars and traditional oak pub chairs, which have a similar back but plain slats. The machine-carved contours of the ample seat is a concession to modern comfort. Its cabriole legs are loosely derived from English furniture of the mid-1700s, but the spindly proportions are intended to be elegant as well as an economical use of wood. The delicate stretchers on the sides are turned with beads in the style of the ornamental wood valances, screens, and porch gingerbread that were popular towards 1900. All of this indicates that this is an ornamental chair made in North America about 1900-1910. It could have been made as an occasional chair on its own; sets of side chairs for the dining room tended to be more substantial. It may also have been part of a bedroom suite.

Check the underside of the seat for evidence of a paper label or a model number. You will also find that this area is smooth because the wood passed through a planing machine. The wood is more likely to be maple, birch, or another hardwood with a rich red mahogany stain. Indigenous hardwoods were preferred by most of the factories that manufactured chairs of this type.

You noted in a postscript that you wondered about the value. Because the Royal Ontario Museum is a public, educational, non-profit institution, its curators are not allowed to place a value on objects. Although I personally find this type of chair quite elegant, it has yet to attract serious scholars or collectors. It would probably not be worth appraising for insurance purposes. In the long term, the chairs of this type that will appreciate in value are those that bear original labels identifying their makers or that can be attributed through catalogues or original invoices, etc. Thank you for writing to ROM Answers.

PETER KAELLGREN,
EUROPEAN DEPARTMENT,
ROYAL ONTARIO MUSEUM

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NOW AND FOR THE NEXT FIVE years, any phenomenon, fad, or fashion that does not lend itself to more logical explanation may be attributed to public edginess about the coming millennium. This seems to be one of the mass media's unspoken but immutable laws.

In the case of the Italian astronomer Galileo there may actually be something to it. Galileo Galilei, who made the first astronomical telescope and confirmed Copernicus's theory that the Earth revolves around the Sun, was born in 1564 and died in 1642. So there's no obvious anniversary coming up to explain the appearance of many new books about him, or the republishing of old ones, or an entire television series to be shown by the Public Broadcasting System in the United States. Believe it or not, though, all this activity has a strong Canadian underpinning.

Far and away the most important Galileo scholar of our age was Stillman Drake of the University of Toronto, who died three years ago at 80, after four decades' work with Galileo's own manuscripts. He wrote a number of vitally important books in the field, especially *Galileo at Work: His Scientific Biography* (1978), and translated or edited many others. Towards the end of his life he distilled what he'd learned in *Galileo: Pioneer Scientist*, which has recently become available again from the University of Toronto Press, as a \$19.95 paperback.

Drake was a historian of science, concerned with the smallest details of Galileo's achievements, from his teenage discovery of isochronism (the law that all the swings of a pen-

dulum take the same amount of time) to his mature discovery of Jupiter's largest moons and the nature of the Milky Way. But part of Drake's importance, it seems to me, is that he lovingly uncovered so much new information about Galileo the whole man—the musician, art lover, inventor, entrepreneur, military engineer, and courtier. Galileo came along almost a full century after Leonardo (and was born three days after Michelangelo died) but he was another of those polymathic Renaissance geniuses, right down to having a complicated history of patronage with the Medici family. I think that's why he's so appealing. Certainly it's the overview and the personality that are being addressed now by popular writers and scholars alike.

One of the people behind the PBS series is James Reston Jr. whose biography *Galileo, A Life* (Harper-Collins, \$33.50) is a much more serious effort than most books that arise from television programs. There's nothing surprising in his approach. In his view, "a central theme of Galileo's life [was the recurrence of] an act of inspiration, born in a religious setting, [which] led to an abstract principle that could be tested through experiment and adapted into an invention for the lasting benefit of mankind." But he makes a fine job of reploughing the field, paying special attention to Galileo's sickly youth in Pisa and, of course, to his censure by the Catholic Church for advancing the Copernican System of the universe over the Ptolemaic one. In 1633 Galileo was hauled before the Inquisition in Rome and forced to renounce his

views. He spent his last years as a prisoner. In 1992 (the same year the most ambitious American spacecraft, the *Galileo*, passed Earth for the last time on its way to Jupiter) the Pope acknowledged the wrong that had been done.

Galileo's long quarrel with the church authorities is usually couched in terms appropriate for describing some massive unavoidable collision of wills and philosophies. But as Mario Biagioli argues with considerable skill in **Galileo Courtier: The Practice of Science in the Culture of Absolutism** (University of Chicago Press, US\$15.95 paper), Galileo was adept at the art of what we would call grantsmanship, using his knowledge of the Vatican and the Medici princes to turn his attention to that which was most likely to find official favour. Biagioli's book is not a matter of debunking Galileo but of putting another feather in his cap: the mathematician, natural philosopher, and Renaissance man was also a master at the deadly game of patronage right up until the last phrase of his life. He had to be. Otherwise he couldn't have accomplished what he did.

Related to this, and similar in its somewhat revisionist (perhaps even slightly iconoclastic) tone, is **Between Copernicus and Galileo** by James M. Lattis (University of Chicago Press, US\$54 cloth, US\$22 paper). The author is at pains to point out that the cosmological ideas that got Galileo into such trouble seemed dangerously radical to the Church only because they could be pitted against those of the now almost forgotten Christoph Clavius, a Jesuit astronomer. For generations,

Clavius's standard textbooks successfully reconciled mediaeval theology with the seemingly contradictory evidence produced by the age of science. It was a kind of consensual arrangement that finally flew apart once Galileo's telescope turned the theoretical into the empirical and made it possible for people to study the planets closely with their own eyes.

In fact, now is a fertile time for ambitious biographies of scientists. For example, Adrian Desmond, the British science historian who won a number of important literary prizes for his 1991 biography *Darwin*, returns with an almost equally full treatment of Thomas Henry Huxley (1825-95), the patriarch of the fear-somely gifted Huxley clan, who threw over botanical research to become the leading agitator in Britain for Charles Darwin's theory of evolution. Hence the ironical subtitle of Desmond's book, **Huxley: The Devil's Disciple** (Penguin Canada, \$35). Huxley's opposite number in the great debate over evolutionism was Richard Owen (1804-92), the specialist in comparative anatomy and vertebrate palaeontology who was also the founder of the Natural History Museum in London and a leader in the 19th-century museum movement generally. Owen was probably the most famous (rather than notorious) scientist of Victorian England, but for modern readers his name is usually associated with his profound professional differences with Darwin. This is unjust, claims Nicholaas A. Rupke in **Richard Owen, Victorian Naturalist** (Yale University Press, US\$45), who argues that Owen's views on natural selection were not exactly those of a diehard Creationist (and in any event were only a tiny part of his career).

A book I found far more original and rewarding is **Trials of an Ordinary Doctor: Joannes Groenevelt in Seventeenth-Century London** by Harold J. Cook (Johns Hopkins University Press, US\$45). Groenevelt was an otherwise obscure

Dutch medical practitioner in London, whose life can be reconstructed today because of a malpractice case in 1694 which has elevated him to the attention of history. The case became a show of strength by the College of Physicians in exerting stricter licensing authority over "doctors of physick," and the book is full of alarming bits of research and some fascinating insights.

Elsbeth Huxley's book **Peter Scott, Painter and Naturalist** (Penguin, \$35) brings the subject of scientific biography full circle. Sir Peter Scott (1909-89) is regarded as the progenitor of the modern-day environmentalist movement in Britain. He was also the son of the Antarctic explorer Robert Falcon Scott—the subject of a previous biography by Elspeth Huxley, author of *The Flame Trees of Thika*—and the widow of Gervais Huxley, grandson of the aforementioned T. H.

SOME OTHER NEW TITLES OF INTEREST
to *Rotunda* readers:

- Maria Tippet has become one of the prolific Canadian cultural historians—all the more so, it would seem, since moving to Britain, where she spends much of the year, teaching at Cambridge. Her transatlanticism was no doubt an advantage in producing **Between Two Cultures: A Photographer among the Inuit** (Penguin Canada, \$50), because Charles Gimpel, the photographer in question, was an English art dealer and eccentric who fell in love with Canada's Far North and made many extended journeys there, the last one in 1968. Tippet provides quite a vivid biographical essay to accompany 150 of his images, all of them documenting the last generation of Inuit life free of the snowmobile and other culture-destroying conveniences—though the slow encroachment of southern ways is one the recurring themes of these often poignant pictures. Gimpel, by the way, was the first art professional outside North America to see the importance of Inuit art and to act on it in terms of the art marketplace. Now that marketplace is a

vital part of the equation of Inuit life. As time has gone on, and collectors have become more sophisticated and knowledgeable, the Inuit talent pool has come to seem less homogeneous, with the careers of particular artists taking on a life of their own, distinct from the work of the community. One of the results is a book such as **Inuit Women Artists** by Odette Leroux, Marion E. Jackson, and Minnie Aodla Freeman (Douglas & McIntyre, \$45), which elaborates on an exhibit held at the Canadian Museum of Civilization. Nine quite different artists are dealt with in depth.

- There's a great deal of charm to be found in old cookery books—ones old enough to be quaintly useful but not so old as to represent dishes that have vanished completely. **The Cincinnati Cookbook** edited by David E. Schoonover (University of Iowa Press, US\$24.95) is based on a popular work first published in 1909 in Cincinnati, Ohio, a prosperous industrial city where a large German population tended to dominate or at least flavour the local cuisine. By then, household refrigeration was common, and so many of the recipes are still applicable technologically; a few sound downright attractive. Lots of household hints, folk wisdom, and financial and family advice round out the text, as do facsimiles of period ads ("Dr. Stowers Chiropodist and Masseur—Ladies' Shoe Shining Parlor attached").

- **Reading Rock Art: Interpreting the Indian Rock Paintings of the Canadian Shield** by Grace Rajnovich (Natural Heritage, \$24.95) is a useful paperback guide, not to particular pictographs but to pictographs in general, or rather to the more than 400 from Quebec to Saskatchewan which, collectively, record the 10,000-year legacy of the Algonkian-speaking Cree and Ojibway. At the heart of the book is a chapter that discusses the recurring symbols one by one and what they are thought to mean.

- Mark Monmonier has a habit of coining needless words in his book

Drawing the Line (Fitzhenry & Whiteside, \$39.95), which is subtitled "Tales of Maps and Cartocontroversy" and claims to be about a field he calls "carto-anthropology." This tendency aside, he's written an attractive study of how maps have been used as propaganda tools and political aids. He goes far beyond the question of changing place-names (he cites Quebec, for example) and discusses such subjects as the ways in which maps have been used in what the Americans call gerrymandering (the redrawing of electoral boundaries for partisan purposes) and in the selection of nuclear-waste dump sites. Monmonier, who teaches at the University of Syracuse, often falls back on examples in New York State but the implications are universal.

- **Phantom Islands of the Atlantic** by Donald S. Johnson (Goose Lane Editions, \$19.95 paper) discusses in some detail the existence, on paper and in people's imaginations, of various North Atlantic islands which, as European exploration pushed forward and more and more knowledge was added to the cumulative map of the world, turned out not to be real.

- Indirectly, George and Roberta Poinar made possible the plot of Steven Spielberg's film *Jurassic Park*, for it was they who discovered that the DNA of insects and other life-forms (many of them extinct) can be found trapped in amber, the fossilized resin of long-dead trees. Their book **The Quest for Life in Amber** (Addison-Wesley, \$31.95) is more than a solid popular account of their scientific work. It also explores the world of amber-hunters, amber-thieves, amber-dealers, and amber-collectors: a bizarre and sometimes fascinating subculture. Most amber comes from the Baltic coast but it's also found in a number of other places, from the Caribbean to Australia—to Alberta. The Poinars make a good story of it.

DOUGLAS FETHERLING

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COLLECTION NOTES CONTINUED

West Asian Department, referred me to a book illustrating an artifact that was an exact match. The accompanying text described the item as a chanfron used in Sudan in the late 19th century as armour "said to be for camels." Next I consulted Susan Woodward of the Mammalogy Department who placed a camel skull next to a horse skull. The chanfron precisely fit the camel but was awkward on the horse.

Given that the chanfron was designed for camels in late 19th-century Sudan, its presence on the Blood Reserve would seem extremely peculiar; however, there are some possible explanations. In the second half of the 19th century, camels were introduced to North America for various purposes. Between 1856 and 1860, the United States cavalry experimented with a camel corps for transportation and for battling Indians in the southwest, and between 1862 and 1867 at least two caravans were used for transportation, not far from the Blood Indian territory in

Montana. Camels also served as transportation during the Cariboo gold rush in British Columbia.

Although there is little likelihood that camel armour was used for these ventures, there was at least one opportunity for Canadian Indians to travel to Africa in the 1800s. Not long before the Battle of Omdurman in 1898, Lord Wolseley set out to rescue Major-General Gordon at Khartoum. To assist him in his quest, he recruited a large contingent of Indians from as far west as Winnipeg to serve as voyageurs on the boat trip down the Nile. Perhaps the ROM's chanfron started its journey to the Blood Reserve as spoils of war. Whatever the actual story may be, the chanfron must make one more trip, this time from the Plains Indian to the North African storage area of the ethnology collections.

ARNI BROWNSTONE

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